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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|---|---|---|---|
| 10/538,508 | 01/06/2006 | Andrew Charlton Clothier | 424662011500 | 1875 |

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| EXAMINER | |
|---|---|
| RO, BENTSU | |

| ART UNIT | PAPER NUMBER |
|---|---|
| 2837 | |

DATE MAILED: 06/23/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 10/538,508 | CLOTHIER ET AL. | |
| | Examiner | Art Unit | |
| | Bentsu Ro | 2837 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1-5,7-16 and 18-22* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-5,7-16 and 18-22* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *6/9/05*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

**FIRST OFFICE ACTION**

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 2, 3 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 2 and 3 are rejected because the defined voltage dropping across the capacitor (a ripple voltage) is contradictory to that defined in claim 1.

Claim 1 defines *"wherein the capacitor is configured such that the voltage across the capacitor falls below 15% of the nominal peak rectified voltage"*. Thus, claim 1 defines a minimum 15% ripple voltage.

Claim 2 defines a 10% ripple voltage and claim 3 defines a 5% ripple voltage. The 10% ripple voltage and the 5% ripple voltage contradict the 15% minimum ripple voltage because the words "falls below". The 10% and the 5% DO NOT fall below 15% as required by claim 1. Speak differently, claims 2 and 3 have contradictorily broadened the subject matter of claim 1.

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 1-5, 7-16 and 18-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kuriyama US Patent No 5,705,904.

Claims read onto Kuriyama's teaching as follows:

| The claims: | Kuriyama's teaching: |
|---|---|
| 1. A power conversion apparatus for converting power from an alternating source to dc, comprising: | Fig. 2 (or Fig. 1) shows a power conversion apparatus for converting ac power to dc link voltage; |
| an input stage for receiving power from the alternating source, wherein input stage includes an input filter, | Fig. 2 shows an input stage including input terminals R, S, T for receiving ac power source and input ac inductors 24, the input ac inductors are input filters; |
| a rectifier for rectifying the alternating signal, | Fig. 2 shows an ac-dc converter 5, the converter 5 is an ac rectifier for converting an ac power to a dc power at the dc link; |
| a capacitor for storing energy from the rectified signal, | Fig. 2 shows a capacitor 15 for storing energy from the converter 5; |
| an output for outputting power from the rectifier and the capacitor to the pulsed load, | Fig. 2 shows an inverter 2, the inverter 2 outputs pulsed power from dc link to drive an induction motor 3 by pulse width modulation (PWM); |
| wherein the pulsed load has at least one switched winding which receives power from the output, | the induction motor 3 is a three-phase motor, therefore, it has at least three windings; |
| and wherein the capacitor is configured such that the voltage across the capacitor falls below 15% of the nominal peak rectified voltage of the source during each cycle of the alternating source. | Kuriyama clearly teaches the fluctuation of capacitor voltage, however, Kuriyama does not teach<br><br>"*the voltage across the capacitor falls below 15% of the nominal peak rectified voltage of the source during each cycle of the alternating source*"<br><br>it is noted that the fluctuation of the capacitor voltage has nothing to do with the ripple voltage, the fluctuation of capacitor voltage only indicates that (1) the dc link voltage is not a constant voltage, therefore, a ripple voltage does exist, and |

| | |
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| | (2) the capacitor 15 may be relatively small so that the capacitor voltage can be fluctuated;<br><br>thus, Kuriyama does not teach the 15% ripple voltage, however, the 15% ripple voltage possibly is met by Kuriyama Fig. 1 or Fig. 2 circuit because of the following reasons: |

**REASONS:**

The percent ripple voltage inversely depends on the following three factors:

- frequency of the ac power source; the lower the ac frequency the higher the ripple voltage;
- the value of the capacitor 15; the smaller that capacitance, the higher the ripple voltage;
- the impedance of the load (or motor winding impedance), the lower the load impedance, the higher the load current, and therefore, the higher the ripple voltage.

Claim 1 does not define the frequency of the ac source, the value of the capacitance, and the value of the load impedance. If the capacitor 15 is small (as explained in the chart) and the load impedance is small (the motor usually has a relative small winding impedance because most motors consume high current), the ripple voltage can well exceed 15%.

| | |
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| 2 and 3. | the 10% and 5% ripple voltages are met by the Kuriyama's teaching because the 10% and 5% are broader than the 15% value. |

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| 4. A power conversion apparatus according to claim 1 or 2, wherein the capacitor is configured to store the amount of energy which is released from the winding when the winding is switched off. | the capacitor 15 stores energy from either side of the converter 5 or the inverter 2 as long as the voltage on either side is higher than the voltage at the capacitor 15. |
| 5. A power conversion apparatus according to claim 1 or 2, wherein the pulsed load has a switching frequency which is greater than 2 KHz. | most PWM switching frequency is 20 KHz or more because this frequency is outside hearing range of human being. |
| 7. An electrical apparatus comprising a power conversion apparatus according to claim 1 or 2 and a pulsed load. | the induction motor 3 is a pulsed load. |
| 8. An electrical apparatus according to claim 7, wherein the pulsed load is an inductive load<br><br>which is repeatedly switched between an on state and an off state,<br><br>wherein the duration of the on state is less than the off state<br><br>so as to minimize or avoid flux build up in the inductive load. | the induction motor 3 is a pulsed load;<br><br>the PWM repeatedly switches between an on state and an off state;<br><br>depending on the required motor torque, the PWM can be ranged from 0% (no load) to 100% (full load);<br><br>the flux build up depends on the ampere-turns of the motor winding, if winding duty cycle is low, the flux would not build up rapidly. |
| 9 and 18. | motor windings are at least one switched phase winding. |

The subject matters of claims 10 and 19 (switched reluctance motor), 11 and 20 (impeller), 16 (power supply), 13 and 21 (surface treating device), 14 (agitator), 12, 15

and 22 (vacuum cleaner) are merely an obvious intend use. The Kuriyama's power converter circuit can be used with any device that required a variable frequency power supply or a PWM power supply, including a switched reluctance motor, an impeller, a variable frequency power supply, a surface treating device, an agitator, a vacuum cleaner, and many more.

**A SPECIAL NOTE FROM THE EXAMINER:**

In rejecting claims 10-16, 19-22, the examiner does not provide any reference to support his rejection because these claims are restrictable. In the response, if applicant argues the patentability based on the different types of uses, the examiner definitely and positively will restrict these claims so that the examiner can concentrate the search only on one single type of device.

In this situation, applicant must cancel all different devices except one. However, applicant can file divisional applications to cover those claims that have been canceled.

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

6. Any inquiry concerning this communication should be directed to Bentsu Ro at telephone number 571 272-2072.

6/20/2006

Bentsu Ro
Senior Examiner
Art Unit 2837